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ABSTRACT

The University of Northern Colorado allowed the Department of Science Education to convert a room into a classroom museum called the Zooroom City. The classroom contains 85 stuffed or injected animals and 30 live animals. The room is used eight hours a day, six hours for college methods classes and two hours for elementary students. Questionnaire data from a survey of about 500 teachers regarding the use of the Zooroom City, descriptions of the exhibits, and student comments and questions regarding the exhibits are included. (RH)

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ZOOROOM CITY: AN "ACTION" CENTERED MUSEUM IN THE CLASSROOM

1976 Star Award Winner

by

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Introduction

The "hands-on" approach has been used in Zooroom City with fantastic success for thousands of children in Colorado and Wyoming over the past two years. The excitement generated, the desire to return for a second look, the letters received after a visit point to the success of such a venture; the establishment and the instruction of children with animals in a classroom museum. What better way for a child to learn about an animal than to see it, to hold it, to smell it, to feel it, to talk about it and to ask thought provoking questions.

The administration at the University of Northern Colorado granted the Department of Science Education permission to convert room 358 of Ross Hall into such a classroom. The overwhelming support of the administration has permitted the venture to continue in the absence of both authors. In fact, a senior undergraduate student is in charge of the program for the 1975-1976, school year.

The Classroom

The students who enter room 358, or Zooroom City, are amazed with what they see. One wall is covered with injected birds, another with mounted insects, the ceiling with hanging injected and stuffed specimens (birds, bats, insects and spiders), tables around the room support microhabitats for live specimens and on the floor are "movable" microhabitats and a fish center. The classroom contains eighty-five stuffed or injected animals, prepared by elementary, junior and senior high students, and thirty live animals. This room is used eight hours a day, six hours for college methods classes and two hours for elementary students. The injected animals contain formaldehyde and borax and some of the smaller specimans contain Elmer's glue. The stuffed ones have cotton and/or wood shavings filling their body cavities and they are mounted in natural positions.

The birds on the wall are identified in groups according to certain characteristics. For example, one section contains marsh birds, another woodpeckers and another song birds. This wall is a functional bulletin board where students are asked to compare specimens. Some of the questions students are asked are: How are the sections alike? How are the birds different in feet structure, beak shape, wing coloration, tail shape and color, and size? Why are they different? If you had a choice and you could become one of the birds, which one would you like to be and why?

Another wall contains over 200 mounted insects and spiders. This is another functional wall. Some of the questions asked by pre-service teachers are: How are moths different fron butterflies? How are bugs different from beetles? What is mimicry? Which monarch butterfly is a male and why? How are insects different from spiders?

A niche often neglected in the classroom is the ceiling. The ceiling in Zooroom City contains birds, bats, spiders, lizards, cricket habitats and mammal skulls. Christmas lights, regulated by a timer, flash off and on around skulls hanging from one corner outlined by blue satin. Depending upon the age of the student, different activities are employed. For example, primary grade students touch the skulls and talk about them. Intermediate age students describe the habitats and environments from which the animals are found. Over twenty-five skulls ranging in size from a long horned steer to a hispid cotton rat are used.

Living Centers

The classroom floor contains the following living centers: a fish center, a snake center, a "movable" mouse habitat, a "movable" salamander habitat, a "movable" gerbil habitat, a guinea pig center, a chameleon terrarium, a dove center, a temporary toad and frog microhabitat, and a mealworm and isopod area.

Public school children from Greeley and pre-service teachers helped plan and build the "movable" habitats out of chicken wire, paper mache and scrap lumber. Each habitat is one-half a metre by seventy-six centimetres in dimension with sides and an open top mounted on four steel wheels.

The mouse habitat contains several branches representing trees thirty-five centimetres in height, a hill of paper mache and resin forty-six centimetres tall with a 354 gram empty coffee can on top which serves as a home for the dwellers. The walls along the side of the habitat are twenty-three centimetres tall and made of chicken wire covered with paper mache and resin. The floor of the habitat is covered with a mixture of sand, peat moss and potting soil to a depth of approximately seven centimetres. One male and three female mice live here. Extra inhabitants are given to schools with instruction on how to build this habitat.

The "movable" gerbil habitat resembles an enlarged ant farm. The front is a piece of glass. The sides and back are made of compressed cardboard. Inside the box and covering one-half of the area is a raised area, sixty centimetres high, covered with a soil mixture of peat moss and sand up to a depth of ten centimetres. For exercise the gerbils use a series of plastic tubes situated behind the glass and covered with peat moss and sand. The area immediately behind the glass contains this soil mixture up to seventy centimetres in depth. A family of one male, one female and four offspring occupy this area.

A large body of water covers half of the "movable" salamander habitat. The other half is covered with soil, peat moss and sand. The soil mixture rises one centimetre for every two centimetres in length and is ten centimetres in depth. The bottom of the soil rests in the water and serves as a wick causing different areas of the soil mixture to have different moisture concentration. Two salamander nymphs occupy this habitat.

In the center of the room is a fish center with ten, twenty and thirty gallon aquariums. In these aquariums are feeder fish (goldfish), pirahna and oscar.

Several mammal study skins are in a center. A pair of white doves are in the dove center. A snake center has two boa constrictors, bull snakes and garter snakes. A terrarium houses a pair of chameleons. A guinea pig habitat containing logs, salt stone, water and lots of hay, has two adult guinea pigs.

Experiences with Animals

On a typical day the classroom is filled with thirty students at a time. They are divided into small groups, three to four, depending on the class size, and are placed at random around ten centers for a "hands-on" experience. Each center contains two pre-service teachers. These teachers guide and answer any questions the student raises. To help the teacher cognitively, a list of books and articles in appendix I is provided for each to read. After a week at one center the teachers are assigned to another center. These experiences definitely help the pre-service teacher learn content matter. Each child usually spends three to five minutes at each center.

Over 5,000 questions which were asked by three to sixteen year olds about animals have been collected over the last two years. Enclosed in appendix II is a sample of questions students asked a pre-service teacher during a ten-week period. Students were urged to write a story of their experiences. Many children wrote letters and others expressed themselves through drawings. Some of the letters contained questions and all of these letters were answered. Here are a few examples of letters elementary students wrote:

> "I enjoyed coming. I liked the part where you showed us the snake and the rats. I'm going to show my mother how big Texas rats are. I'll be going to Greeley when I go to college. (5th grade boy).

"I liked the guinea pigs the best, because they were little, fat, cute. They seemed to be shy and frighted (sic) by the noise." (4th grade girl)

"I had a good time there. My favorite animal was the gerbil. My brother had one named Herby but the cats ate him. He bought him at a garage sale for two dollars." (4th grade girl)

"The bull snake was neat. When I saw it I didn't like it. The slimy feel made me get guwers (sic) down my back." (3rd grade girl)

Teachers sent letters expressing their appreciation for the time spent with their students. Here are two examples of letters from teachers:

> "Thank you for making our trip to Zooroom City so enjoyable. We found the day to be highly motivating for our 4th graders. It is exciting to see university personnel bringing innovative techniques into the classroom. Your students seem better prepared to meet the challenge of today's children."
>
> "It has been a long time since I've enjoyed a field trip as much as the one last week that was spent with Steve and you. Your class was a real learning experience for the children as well as for me. Your enthusiasm is tremendous when working with children. I know this is one field trip the children will remember for a long time."

Results

Many teachers who have visited Zooroom City have asked about the possibility of setting up similar, but smaller, areas in their classrooms. A few of the teachers have been so highly motivated as to apply and receive from Colorado state money to construct a similar environment at their school.

There are many paths to travel once a project has been deemed a success. One of Zooroom City's goals is modification through the comments of the visitors. Appendix III is a sample of the questionnaire mailed to 500 teachers who have visited Zooroom City. The chart below provides a description of the results of this survey.

Evaluation Questionnaire

NUMBER	Question	Response	Percentage of Agreeability
2.	After the trip, the students' interest in having animals in the classroom was	increased	75%
7.	I have found that as a result of my visit to Zooroom City that I can incorporate Zooroom City experiences into other areas of the curricula.	yes	83%
12.	Do you think that having animals in the classroom is a good idea?	Yes	98%
13.	Are there district or city regulations in your area prohibiting the keeping of animals in the classroom.	No	90%
14.	Do you feel the presentation of Zooroom City was relevant to the needs and interests of your students?	Yes	93%
15.	Were you favorably impressed with your visit to Zooroom City?	Yes	90%
17.	Do you think Zooroom City has any long range educational value in motivating children	Yes	90%
20.	Do you feel another trip to Zooroom City (for a longer stay) would be worthwhile.	Yes	80%

The above results are those resulting in over 75% agreeability, the other questions received from 40% to 75% in agreeability.

Summary

Zooroom City has proved to be an outstanding learning experience. Both students and teachers have benefited from one another. The pre-service teachers, mostly seniors, have expressed a desire to start these kinds of experiences with their students when they graduate and start teaching.

The excitement on the children's faces when they handle animals; the concern they have for the animals' welfare; the myriad of questions they asked and were answered by prospective teachers; these are the rewarding experiences of Zooroom City.

Appendix I

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Appendix II

April 4th - 1st Grade Students "Urban" - Ft. Collins, by Liesl Iilanes

These first grade students were easily excited and fascinated with all the animals. I noticed that the kids loved relaying newly learned tidbits of knowledge to their fellow students.

EAGLE and PELICAN:

1. Referring to the Eagle:
   *"Why aren't his eyes real?"
   "Look, come here! What am I touching? Come here quick! What am I touching?" (underside of eagles belly, a hole where stuffing couid be felt.)
   "What does he eat? Where does he live? Up high!"
   "He was living, wasn't he?"
   *"Look! Is his mouth real?"
   "Why are his marbles eyes?" (eyes replaced with marbles)
   *"He is scary *he isn't alive?" (apprehensive)
2. Referring to Pelican:

   "How do they stuff it? Is it a faker?"
   "He lives in the muddy swamp - will he fly?"
   *"That's real isn't it?"
   "What is that hook for?" (referring to beak)
   *"How much does it hold?" (referring to pouch)
   "Doesn't the throwup taste awful? It must be good to only babies!" (referring to Pelican's feeding procedure)

* = frequently asked questions

April 9th - 7th Grade Students "Rural" - Brighton, by Liesl Iilanes

These seventh grade students were extremely hard to motivate. They seemed indifferent to their surroundings. They were slightly responsive to the more exotic animals such as the snakes and tropical fish. The apathy naturally carried over into my response, although I tried hard to encourage inquiry. There were very few questions:

SALAMANDER:

"What is that?"

"Can I grab that one?"

"Why can't we keep them out longer?"

"What did you say the name of them was?"

"How come they can't breathe outside the water?"

"Do they bite?"

Quite a learning experience contrasted to the open, lively first graders.

April 11th - 3rd Grade Students "Rural" - Kersy, by Liesl Lilanes

The third grade students from Kersey were fantastic, so exciteable and inquisitive! The questions just poured out -

1. CHAMELEON:
   * "What is it?"
   * "Where is it?"
   "Can I touch it?"
   "Look, look, it's going green - Look! Wow!"
   "Why do they change colors?"
   * "Can I hold one? I want to pick it up".
   "Look, look can you see it change?: (A proud young man as he was holding the chameleon up to his red shirt)
   "How do they change colors?"
   (Talking to another student) "There are two animals in here - can you find them?"
   "Why do they burrow?"
   * "What do they eat?"
   "Which one is the boy?"
   "Are they lizards? They look like them."
   "If I put something green in there will he go green?"

2. GENERAL QUESTIONS HEARD AROUND THE CLASS:
   "Do birds go some place special to die?"
   "How do you stuff the birds?"
   "What do the birds eat?"
   "Where did you get all the animals?"
   "I understand that piranas will eat your skin; but do they eat your meat?"

They seemed fascinated with all of the animals and were delightful to work with!

* - Frequently asked questions

April 16th - 1st Grade Students "Urban" - Ft. Collins, by Liesl Iilanes

These first graders had a minimum of questions. They were very rambunctious and excitable! The children utilized their senses in touching, smelling, listening and observing the animals. The pace was quick and somewhat unorganized!

GERBILS:

"What are they doing?" (washing paws)

* "What do they eat?"

* "Are they eating the paper in there?"

"How much do gerbils cost?"

* "Where do they come from?"

"We have some gerbils, they don't eat much do they?"

* "Will he bite me?"

"How come he won't eat this carrot?"

"Is that big one the boy?"

"Do they make good pets?"

* "Can they get out of this cage?"

* = frequently asked questions

April 21st - Kindergarten, 1st, 2nd, 3rd Grade Students "Rural" - Scott

I had a good time working with the snakes! I was very apprehensive and scared at first! It was quite an experience watching the expressions on each child's face! Predictability of the children's ability to touch and handle the snakes could not be determined by age. One girl, four years old, handled each snake, while a third grade student and his teacher wouldn't get near! There were many questions and much enthusiam!!! - An enjoyable day!

SNAKES:

"Why is the mouse in the cage?" (to feed the snakes)

*"Wow! What kind is that orange snake?" (rat snake)

*"Will they bite?

*"Why is it sticking out it's tongue?" (to smell)

"Why does it move like that?"

*"Will it eat that mouse?"

"How many snakes are in there?"

"I'm scared for that mouse. He won't eat him, will he?"

"What do they eat?" (insects, mice, etc.)

"How do they eat that big mouse?"

*"Can we hold those snakes?" (chicken snake, rat snake)

*"Can I hold one?"

"Where did you get those snakes?"

"Do you have any rattlesnakes?"

"What is the difference between the male and female?"

* = frequently asked questions

April 23rd - 1st Grade Students "Urban" - Loveland By Liesl Lilanes

These first graders were really fascinated with the snakes and although a few were scared, most touched and held them. It was surprising to me the knowledge of snakes that some of the children had! Snakes are interesting creatures for all ages!!!

SNAKES:

*"What is that?" (rat snake)

*"What do they eat?"

*"What is that one?" (chicken snake)

"Does it eat chickens?"

*"Do they bite?"

"Will they eat the mouse?"

*"Why can't we take the other snakes out?"

"What kind of teeth do they have?"

*"What kind of snake is that?" (garter snake)

"What is the matter with that snake?" (tail chewed by mice)

*"Can I hold it?"

"They are going to swallow that mouse?"

"Is that a rattlesnake?"

*"How does it move?"

"Do the snakes eat each other?"

* = frequently asked questions

May 16th - 1st Grade Students - Ft. Lupton, by Liesl Iilanes

An active group with plenty of questions.

Salamanders:

Where do they live?

What do they eat?

Do they turn into frogs?

Are they monster animals?

How can they see?

Can they hear us?

Why are they called mud puppies?

Do they have babies? How many?

What do they change to?

Can I touch him?

Will they bite me?

Do you have some more?

Is the big one a male?

May 21st - 5th Grade Students "Urban" - Longmont

Wow, these kids were fantastic! They were very attentive yet excited and outgoing. They weren't afraid to get involved or ask questions. Several of the kids had experienced guinea pigs either at home or in the classroom and were experts!!

Guinea Pig:

What is that? (guinea pig feces)

Where do they live?

Will they bleed to death if you cut their fingernails?

Will he bite?

They get their water from lettuce and carrots don't they?

How many babies do they have?

Their teeth grow like gerbils, so they have to bite on things..Right?

What do they eat? They don't eat meat, right?

Does she like to be cuddled?

Where did you get her?

How do you tell the difference between the male and the female?

Appendix III

Sample Questionaire

CIRCLE THE BEST RESPONSE

1. The effect of the trip on the class about one month after the trip was: Excellent, Good, Poor, or Negligible.

2. After the trip, the students interest in having animals in the classroom was: Increased or Uneffected.

3. As a result of the "Zooroom City" experience I have observed different student attitudes in social situations. Yes, No, Sometimes.

4. Students who had a poor attitude towards science before the trip now seem to show more interest. All, Some, or None.

5. As a result of the visit to "Zooroom City" the appearance of my room has changed with respect to animals. (pictures, etc.) Yes or No.

6. I now use more stories or anecdotes about animals to introduce new topics (not necessarily science) as a result of my visit to "Zooroom City". Yes or No.

7. I have found that as a result of my visit to "Zooroom City" I can incorporate "Zooroom City" experiences into other areas of the curricula. Yes or No.

8. As a result of the trip I have a more confident attitude towards science. Yes or No.

9. I use more lessons pertaining to animals since the trip to "Zooroom City". Yes or No.

10. I have learned more about animals since the trip. Yes or No.

11. I have asked for new equipment or ordered more materials for housing animals (aquariums, cages etc.) as a result of the "Zooroom City" experience. Yes or No.

12. Do you think that having animals in the classroom is a good idea? Yes or No.

13. Are there district or city regulations in your area prohibiting keeping animals in the classroom? Yes or No.

14. Do you feel that the presentation of "Zooroom City" was relevent to the needs and interests of your students? Yes or No.

15. Were you favorably impressed with your visit to "Zooroom City" Yes or No.

16. Has your visit affected a positive change in your attitude towards having animals in the classroom? Yes or No.

17. Do you think "Zooroom City" has any long range educational value in motivating children? Yes or No.

18. Did you have animals in your classroom before your trip to "Zooroom City"? Yes or No.

19. Do you have any more animals in your clasroom since your visit to "Zooroom City". Yes or No.

20. Do you feel another trip to Zooroom City" (for a longer stay) would be worthwhile? Yes or No.